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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/684,684	10/15/2003	Kohei Yamanaka	Q76899	3402

23373 7590 03/08/2007  
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WASHINGTON, DC 20037

EXAMINER
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GARCIA, ERNESTO

ART UNIT	PAPER NUMBER
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3679

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/08/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<p align="center"><b>Office Action Summary</b></p>	<p><b>Application No.</b></p> <p>10/684,684</p>	<p><b>Applicant(s)</b></p> <p>YAMANAKA ET AL.</p>	
	<p><b>Examiner</b></p> <p>Ernesto Garcia</p>	<p><b>Art Unit</b></p> <p>3679</p>	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 December 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4-11 and 21-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-11 and 21-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

### ***Drawings***

The drawings were received on September 13, 2006. These drawings are acceptable.

### ***Claim Objections***

Claim 21 is objected to because of the following informalities:

regarding claim 21, --at-- should be inserted after "except" in line 13. Appropriate correction is required. For purposes of examining the instant invention, the examiner has assumed these corrections have been made.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 24 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 24, the recitation "the clearance is established at room temperature" in lines 1-2 is nowhere supported in the disclosure. Although a clearance is present in the figures, the figures do not provide any support for it being established "at room temperature". While paragraph 0078 of the original specification makes reference to an "ordinary temperature" and gives an example of about 30 or 40 degrees Celsius, this does not support the now claimed "at room temperature". This is a new matter rejection.

### ***Claim Rejections - 35 USC § 102***

Claims 1, 4-7, 9, 11, 21, 23, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Dent, 3,652,111.

Regarding claim 1, Dent discloses, in Figures 4 and 8, a structure comprising a shaft member **10** and a cylindrical member **22**. The shaft member **10** is formed out of a

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first material (col. 1, lines 18-24). The shaft member **10** has an outer periphery formed with an axial groove **64** and a circumferential groove **36** (see Figure 3). The axial groove **64** and the circumferential groove **36** have a cross-section having opposed faces **A1** (see marked-up attachment) substantially parallel to each other. The cylindrical member **22** is fitted to the outer periphery of the shaft member **10**. The cylindrical member **22** is formed out of a second material greater in linear expansion coefficient than the first material (col. 1, lines 18-24). A caulked portion (not shown; see col. 6, lines 29-34) is provided to the cylindrical member **22** at an intersection of the axial groove **64** and the circumferential groove **36**. The caulked portion has a continuous and deformed inner surface in press contact with the opposed faces **A1** of the axial groove **64** and the circumferential groove **36**. The axial groove **64** is greater in depth than the circumferential groove **36** (col. 4, lines 35-38).

Regarding claim 4, a circumferential width of the caulked portion is greater than a circumferential width between the opposed faces **A1** of the axial groove **64** at the intersection.

Regarding claim 5, a first caulked part corresponding to the circumferential groove **36** and a second caulked part corresponding to the axial groove **64**. The second caulked part is arranged substantially in a middle of the first caulked part.

Regarding claim 6, the axial groove **64** comprises a plurality of groove portions in a circumferential direction.

Regarding claim 7, the groove portions are three in number.

Regarding claim 9, the cylindrical member **22** is apart from the shaft member **10** by a clearance **A2** except at the caulked portion **18**.

Regarding claim 11, the shaft member **10** comprises an input shaft and an output shaft (not shown; col. 5, lines 43-45). The shaft member **10** comprises the input shaft. The input shaft and the output shaft are arranged relatively rotatably with respect to each other (note that forces applied at opposite end of the structure will result torsion thus the output shaft will rotate relative to the input shaft). Regarding the intended use recitation, it is the patentability of the product and not how it is intended to be used that is to be determined. No structure is imparted to the shafts by this recitation of intended used. Nevertheless, the input shaft and the output shaft can be used for a torque sensor of an electric power steering apparatus.

Regarding claim 21, Dent discloses, in Figures 4 and 8, a structure comprising a shaft member **10** and a cylindrical member **22**. The shaft member **10** is formed out of a first material (col. 1, lines 18-24). The shaft member **10** has an outer periphery formed with at least one of an axial groove **64** and a circumferential groove **36** (see Figure 3).

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The axial groove **64** has a cross-section having opposed faces **A1** (see marked-up attachment) substantially parallel to each other. The cylindrical member **22** is provided to the outer periphery of the shaft member **10**. The cylindrical member **22** is formed out of a second material greater in linear expansion coefficient than the first material (col. 1, lines 18-24). A caulked portion (not shown; see col. 6, lines 29-34) is provided to the cylindrical member **22** at a position corresponding to the axial groove **64** of the shaft member **10**. The caulked portion has a deformed inner surface in press contact with the opposed faces **A1** of the circumferential groove **36**. The cylindrical member **22** is spaced apart from the shaft member **10** by a clearance **A2** except at the caulked portion.

Regarding claim 23, the clearance **A1** is sufficient to loosely fit an inner periphery side of the cylinder member **22** over the outer surface of the shaft member **10**.

Regarding claim 24, the clearance **A1** is established at room temperature.

***Claim Rejections - 35 USC § 103***

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dent, 3,652,111, in view of Fujioka et al., 4,716,756.

Regarding claim 8, Dent, as discussed, fails to disclose the axial groove **64** and the circumferential groove **36** being rectangular. Applicants are reminded that a change in the shape of a prior art device is a design consideration within the skill of the art. In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). Fujioka et al. equally teach a groove being rectangular to make a connection. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to design the groove be rectangular in cross section as taught by Fujioka et al., Fig. 8, since such groove will perform equally well to make a connection.

Claims 10 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dent, 3,652,111, in view of Edgemond, Jr., 3,642,311.

Regarding claim 10, Dent fails to disclose the axial groove **64** having an opening edge formed at an acute angle. Edgemond, Jr. teaches, in Figure 2, an axial groove **18** having an opening edge formed at an acute angle. Edgemond, Jr. does not state why the opening edge is formed at an acute angle. Applicant is reminded that side faces of a rectangular axial groove formed on a cylindrical surface inherently form an opening edge at an acute angle as part of an inherent feature when using rectangular grooves. Therefore, as taught by Edgemond, Jr., it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the axial groove of Dent with an opening edge formed at an acute angle as part of forming an axial groove being



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rectangular on a cylindrical surface instead of using semicircular grooves since a rectangular groove requires less machining than a semicircular groove.

Regarding claim 22, given the modification the opening edge will be inherently formed at an acute angle at the intersection since all the grooves will be modified to rectangular grooves.

### ***Response to Arguments***

Applicants' arguments with respect to claims 1, 4-11, and 21-24 have been considered but are moot in view of the new grounds of rejection.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. The new limitation "continuous" in claim 1, line 10, and "spaced apart ... by a clearance except the caulked portion" in claim 21, line 13, necessitated the new grounds of rejections. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ernesto Garcia whose telephone number is 571-282-7083. The examiner can normally be reached from 9:30-5:30. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel P. Stodola can be reached at 571-272-7087.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*E.J.*

*Daniel P Stodola*

E.G.

March 5, 2007

Attachment: one marked-up page of Dent, 3,652,111

DANIEL P. STODOLA  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3500

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Dent, 3,652,111

